



Landforms of Utah

Fifth Grade Science Concepts



Utah Science Core Curriculum

5th Grade

Science Benchmark

The Earth's surface is constantly changing. Some changes happen very slowly over long periods of time, such as weathering, erosion, and uplift. Other changes happen abruptly, such as landslides, volcanic eruptions, and earthquakes. All around us, we see the visible effects of the building up and breaking down of the Earth's surface.

Standard II

Students will understand that volcanoes, earthquakes, uplift, weathering, and erosion reshape Earth's surface.

- Obj. 1 Describe how weathering and erosion change Earth's surface.
- Obj. 2 Explain how volcanoes, earthquakes, and uplift affect Earth's surface.
- Obj. 3 Relate the building up and breaking down of Earth's surface over time to the various physical land features.



List of slides*

1. Landforms of Utah
2. 5th grade science core curriculum
3. List of slides
4. Quick outline

Objective 2

5. How volcanoes, earthquakes, and uplift affect Earth's surface.
6. Volcanoes create landforms
7. Volcanic eruptions create different mountains
8. Cinder cone and shield volcano
9. Composite volcano
10. Crater
11. Islands
12. Earthquakes create landforms
13. Fault
14. Fault scarp
15. Wasatch fault scarp
16. Mountains and valleys
17. Uplift creates mountains and plateaus
18. Uplift and different types of mountains
19. Volcanic mountains and fault-block mountains
20. Folded mountains and dome mountains
21. Plateaus

Objective 1

22. Erosion on plateaus

23. River erosion & deposition / meandering river
24. Entrenched meanders
25. River erosion during flooding
26. Different canyon shapes
27. Glacier
28. Glacier erosion (cirque)
29. Glacier deposition (moraine)
30. Wind erosion & deposition
31. Weathering
32. Freeze-thaw weathering
33. Freeze-thaw weathering creates different geological features
34. How arches form
35. Arches vs. bridges

Objective 3

36. Grand Canyon
37. Island in the Sky

Extra

38. Lake Bonneville shorelines
39. Landslide – fast erosion & deposition

* See notes with each slide for definitions and explanations.

* Some slides are animated (so keep on clicking!)



Quick outline

Objective 2 Explain how volcanoes, earthquakes, and uplift affect Earth's surface

(slides # 5 – 21)

- Volcanoes can create mountains, craters, and islands.
- Volcanic eruptions can create different types of mountains: cinder cone, shield volcano, composite volcano.
- Earthquakes can create fault scarps, mountains and valleys.
- Uplift can create mountains and plateaus.

Objective 1 Describe how weathering and erosion change Earth's surface

(slides # 22 – 35)

- Erosion on plateaus can create mesas, buttes, and pinnacles.
- River erosion and deposition / the meandering river.
- V-shape canyon eroded by a river.
- U-shape canyon eroded by a glacier.
- Wind erosion and deposition.
- Weathering.
- Arches vs. bridges.

Objective 3 Relate the building up and breaking down of Earth's surface over time to the various physical land features (slides # 36 - 37)



Objective 2

Explain how volcanoes, earthquakes, and uplift affect Earth's surface.

- Volcanic eruptions can create mountains and other landforms.
- Earthquakes can create small to large landforms, including mountains and valleys.
- Uplift can result in mountains and plateaus.



Volcanoes

can create . . .

Craters

Mountains



pubs.usgs.gov/gip/volc/types.html



Islands



Photo courtesy of NASA
<http://go.hawaii.edu/about.com/library/gallery/blgallery573.htm>

Volcanic eruptions
can create *different*
types of mountains.

Cinder
cone



Cinder cone near St. George

Shield volcano



Shield volcano north of Great Salt Lake

Composite volcano



Cinder cone

A small cone-shaped volcano with steep sides.



Cinder cone near St. George

Shield volcano

A wide, low-profile volcano shaped like a flattened dome.



Shield volcano north of Great Salt Lake



Composite (stratovolcano) volcano

A very tall and large volcano with steep sides.



<http://Vulcan.wr.usgs.gov/volcanoes>



Crater

A circular-shaped depression at the top of a volcano formed by collapse from a large eruption.





Island

A land mass (smaller than a continent) that is surrounded by water.

The Hawaiian Islands are formed by volcanic eruptions.



Photo courtesy of NASA
<http://go.hawaii.about.com/library/gallery/blgallery573.htm>

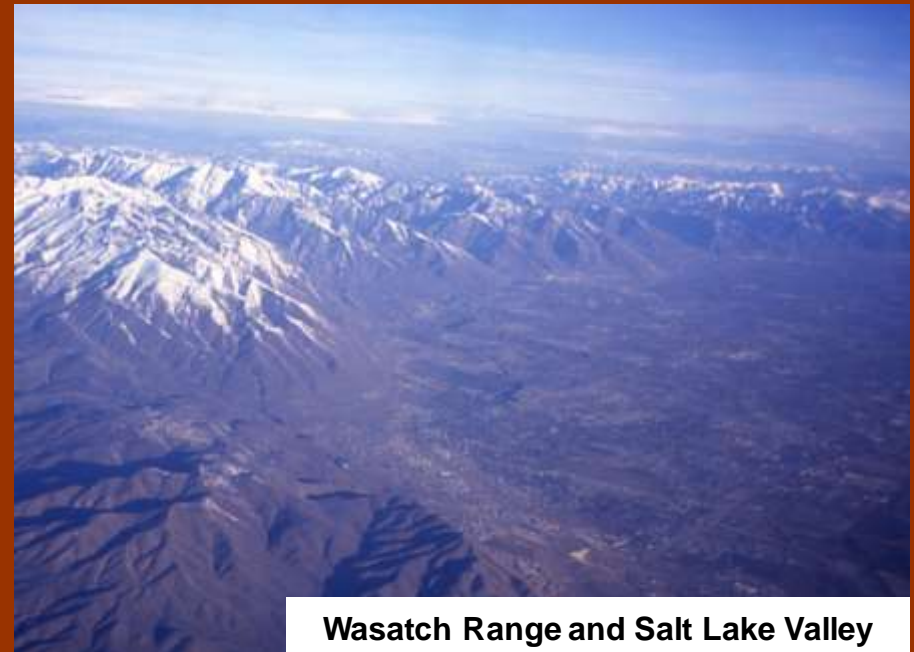


Earthquakes can create ...

Fault scarps



Mountains
and valleys

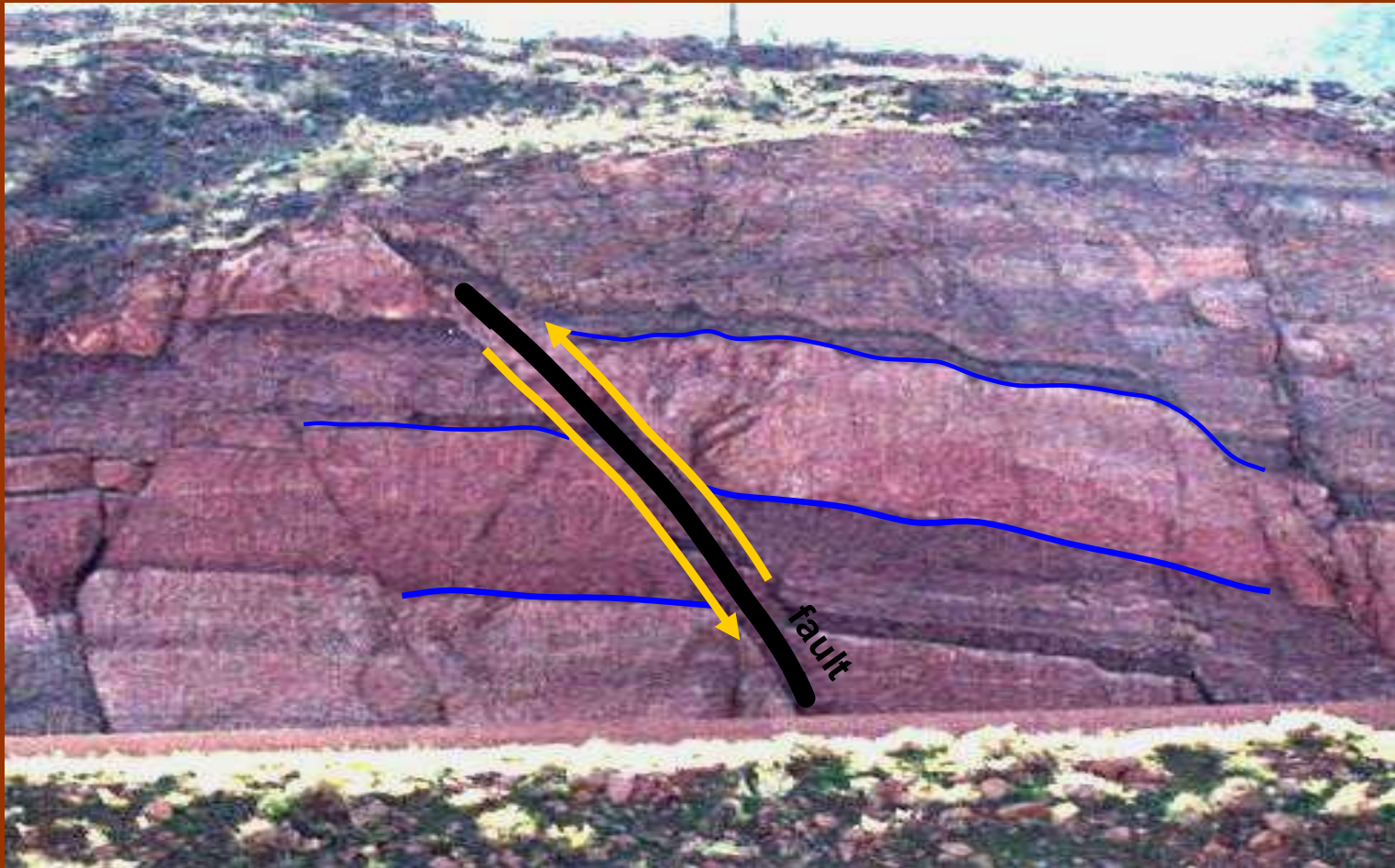


Wasatch Range and Salt Lake Valley



Fault

A crack in the Earth's surface along which two rock masses slide past one another.



Fault scarp

A steep break (escarpment) that forms where vertical fault movement reaches the ground surface.





Fault scarp formed by movement along the Wasatch fault.





Mountains and valleys



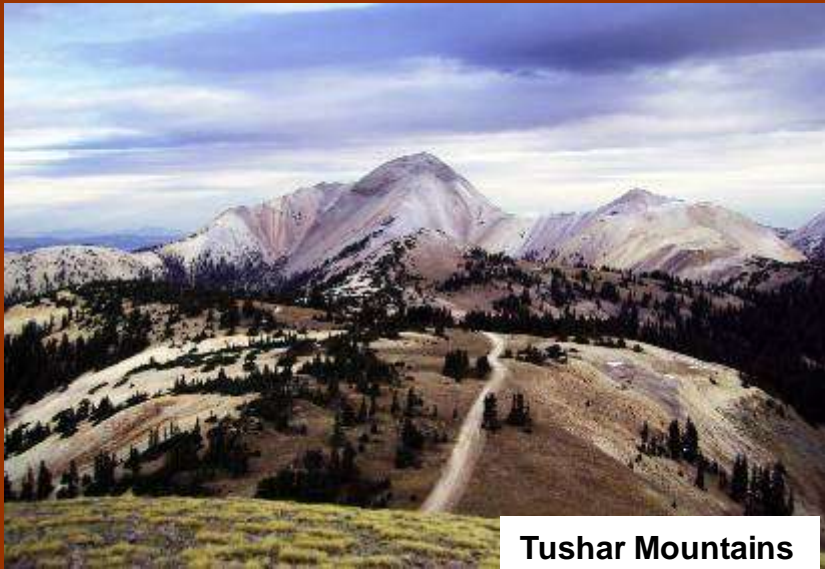


Uplift

A rise of land to a higher elevation.

Uplift can create ...

Mountains



Tushar Mountains

Plateaus



Colorado Plateau

Digital.lib.uiowa.edu/cdm4/results.php?CISOOP



Uplift can result in creating *different types of mountains.*

Volcanic
mountains



<http://vulcan.wr.usgs.gov/volcanoes>

Folded
mountains



Fault-block
mountains



Wasatch Range

Dome mountains



Navajo Mountain



Volcanic mountain

A mountain that forms as rising magma erupts onto the Earth's surface.



<http://Vulcan.wr.usgs.gov/volcanoes>

Fault-block mountain

A mountain that rises along a fault.





Folded mountain

A mountain formed by compression of the Earth's crust.



<http://gsc.nrcan.gc.ca/natmap/cf/images/syncline440.gif>

Dome mountain

A mountain produced where a region of flat-lying sedimentary rocks is bowed upward to form a structural dome.



Navajo Mountain



Plateau

A large, wide landform that is much higher than the adjacent land.



Colorado Plateau

Digital.lib.uiowa.edu/cdm4/results.php?CISOOP



Straight Cliffs

Kaiparowits Plateau

Objective 1

Describe how weathering and erosion change Earth's surface.

Erosion

The wearing away and carrying away of land by water, wind, or moving ice.

Erosion on plateaus results in different geological features.





River erosion and deposition

Meandering
rivers

Erosion

The wearing away and carrying away of land by water, wind, or moving ice.

Deposition

The laying down of eroded material (sediments) by water, wind, or moving ice.

San Juan River



Picasaweb
<http://picasaweb.google.com/lh/view?q=san%20juan%20river%20&psc=G&filter=1#5212557515730750498>





San Juan River

Entrenched meanders

River erosion during flooding

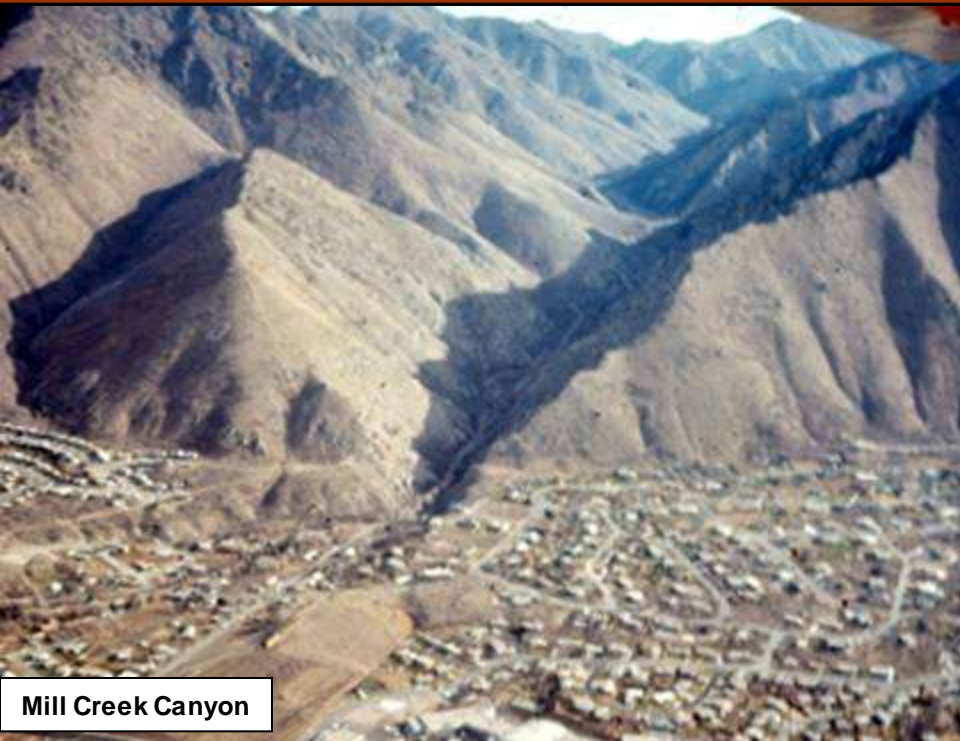


Santa Clara River





Different types of erosion
create *different canyon* shapes.



Stream-eroded canyon
"V-shaped"



Glacier-eroded canyon
"U-shaped"



Glacier

A large sheet of moving ice.





Glacial erosion
creates other
geological
features . . .

Cirque

Semi-circular bowl formed at
the head of a glacier.

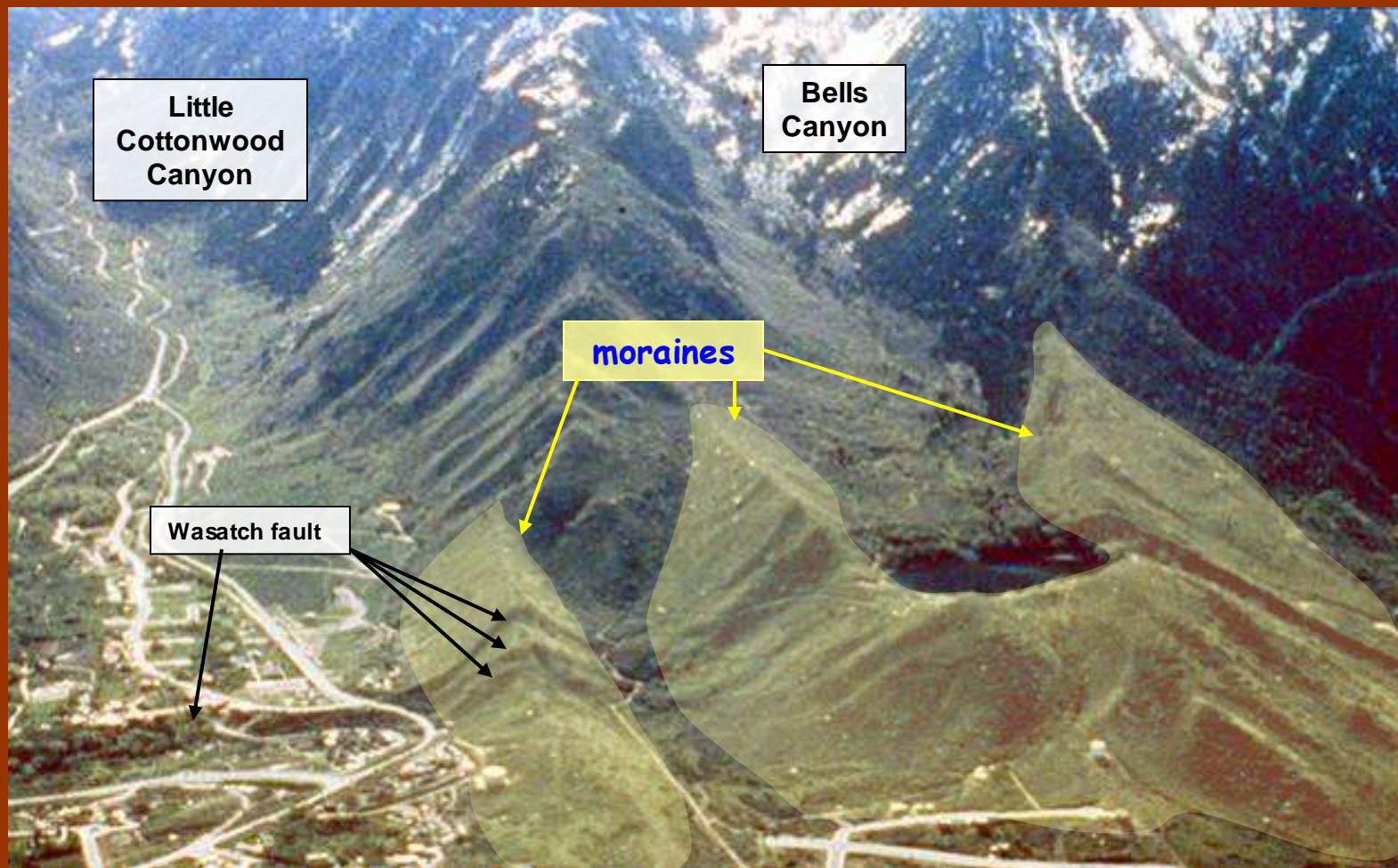




Glacial deposition
creates geological
features . . .

Moraine

Ridge-like landform deposited
at the end or sides of a glacier.

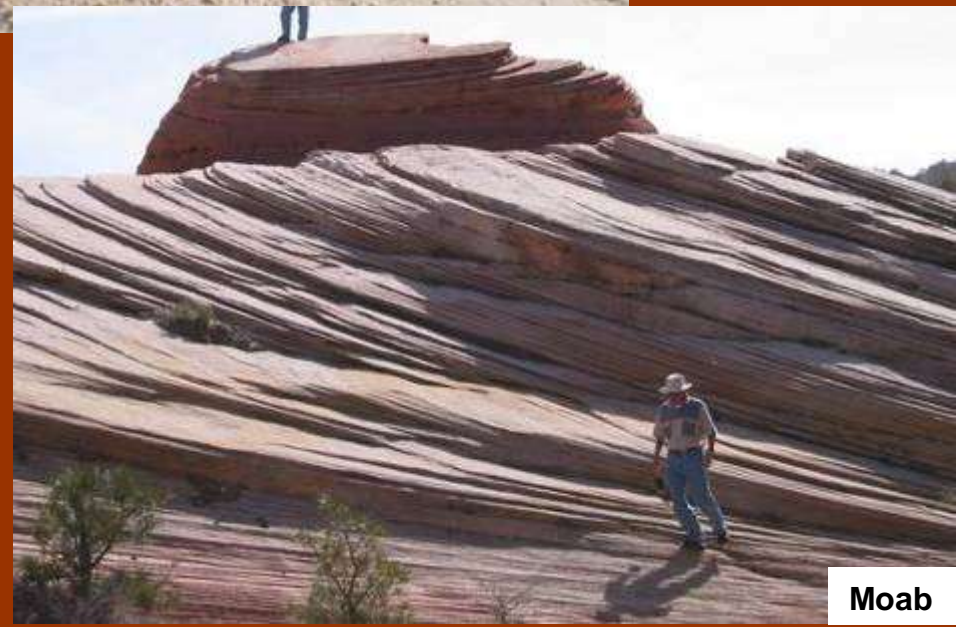




Wind erosion and deposition



Little Sahara Recreation Area



Moab

http://www.gps.caltech.edu/~cartape/personal/images/ge136/ge136_photos.html



Weathering

The breaking down of rocks into smaller pieces by natural processes. Rocks can be broken down by water, air, chemicals, temperature changes (freezing and thawing), and plant and animal activity.





Freeze-thaw weathering

The breaking down of rock by repeated cycles of freezing and thawing of water in cracks and other openings in rock.



Water fills a crack and freezes to ice and expands, which can break apart the rock.

stloe.most.go.th/.../302/images/3_2_3.jpg



Weathering caused by freeze-thaw can create . . .



Rock
falls

Hoodoos



Arches





How arches form



Photo courtesy of Louis J. Maher, Jr.

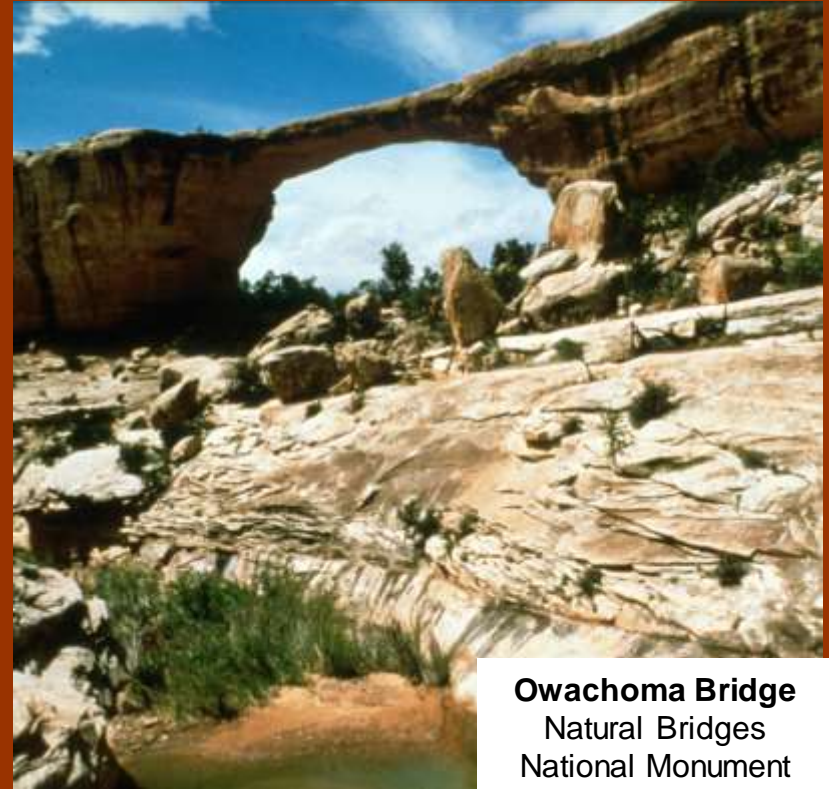
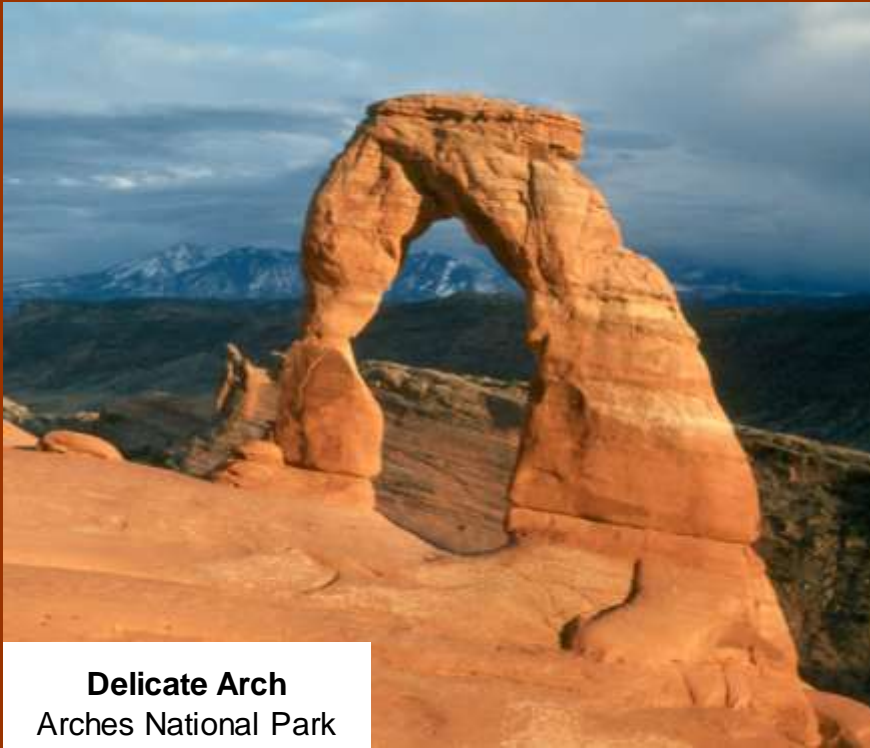
<http://www.geology.wisc.edu/~maher/air/air05.htm>



Arches

vs.

Bridges





Objective 3

Relate the building up and breaking down of Earth's surface over time to the various physical land features.



Photo courtesy National Park Service
<http://www.nps.gov/archive/grca/photos/>

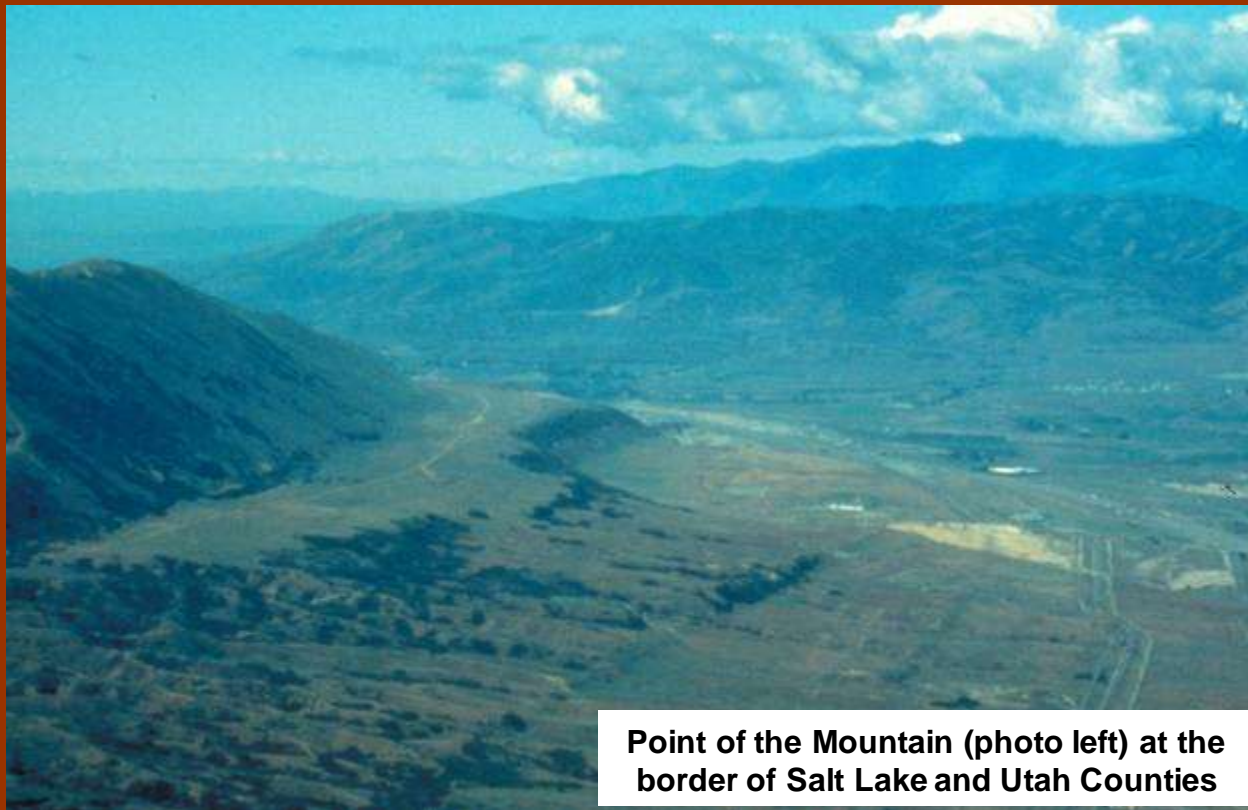


**Candlestick Butte & Island in the Sky
Canyonlands National Park**



Extra (1 of 2): for
interested teachers

Lake Bonneville shorelines



**Point of the Mountain (photo left) at the
border of Salt Lake and Utah Counties**



Extra (2 of 2): for
interested teachers

Fast/big step erosion and deposition by a landslide



**Thistle Landslide
Utah County**